

# Generation of 2D Computational Domains using SnappyHexMesh in OpenFOAM

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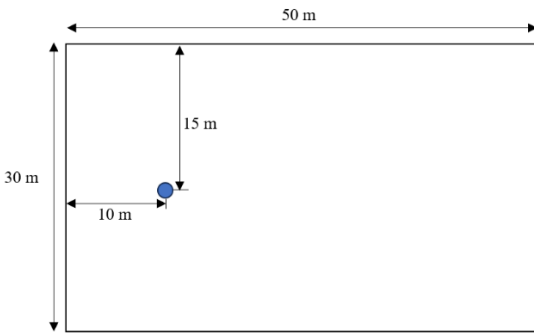
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## Abstract

The quality of computational mesh has a significant impact on the precision and effectiveness of Computational Fluid Dynamics (CFD) simulations. Among the meshing tools available in OpenFOAM, snappyHexMesh (SHM) offers a robust and versatile approach for generating high quality meshes around regions of interest. This report focuses on creating 2D computational mesh using snappyHexMesh for different regions of interest which include a circle, semi-circle, square, horizontal rectangular strip and vertical rectangular strip. SnappyHexMesh (SHM) can perform local refinement with automated surface snapping and boundary layer generation while ensuring mesh quality. This report explains each parameter of the snappyHexMeshDict in depth along with highlighting its role in the meshing process. This study shows that snappyHexMesh enables efficient, flexible and accurate mesh generation for diverse 2D domains, thereby facilitating reliable CFD analysis.

**Keywords:** snappyHexMesh, meshing, blockMesh, 2D domain, extrudeMesh, CFD.



**FIGURE 1.** Schematic representation of computational domain.

Sr. no	Geometry	Dimension
1	Circle	Diameter: 1 m
2	Square	Side Length: 1 m
3	Semi-circle	Diameter: 1 m
4	Horizontal Rectangle	Length: 1m Width: 0.1 m
5	Vertical Rectangle	Length: 0.1m Width: 1 m

**Table 1.** Geometry dimensions details